

Office Memorandum • UNITED STATES GOVERNMENT

TO : Refuge Manager, Stillwater Refuge, Fallon, Nev. DATE: September 26, 1950
FROM : Wildlife Refuge Supervisor, Portland, Oregon
SUBJECT: Narrative Report (1-R)

We have not as yet had an opportunity to review in detail your Narrative Report for the Stillwater Refuge and other areas under your supervision, period May-August 1950, but there is every indication that this report stands as a credit to you and your staff and to the Service for the accomplishments during the period and the able manner in which these have been recorded. There is every evidence that the program there is being carried out on an organized basis and working definite objectives. We were particularly pleased to receive the information on the Anaho Island, Fallon and Winnemucca areas and to know you are giving some attention to these.

The photographic section of the report was outstanding and adds very materially to the value of the report and for future reference purposes. You and your staff are carrying a heavy load in public relations work which we appreciate is time-consuming but is paying dividends through gaining public support.

It is noted that you overlooked including the form NR 8-A, Grain Report, for the period. We are forwarding the original copy of the Narrative Report to the Washington office, and upon receipt of the Grain Report will forward the two copies and ask that these be attached. Please give early attention to the preparation of this report in order that there may be no undue delay in having the information available.

Our thanks to you and your staff for this good job.



Kenneth F. MacDonald

cc Washington Office

NARRATIVE REPORT

STILLWATER WILDLIFE MANAGEMENT AREA

May - June
July - August
1950

PERSONNEL

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David B. Marshall	- - - - -	Refuge Manager
LeRoy W. Giles	- - - - -	Biologist
Illa E. Cress	- - - - -	Clerk-Typist
Carter S. Hughes	- - - - -	Mechanic
Earl W. Nygren	- - - - -	Maintenance Man

INDEX

	Page
WEATHER CONDITIONS	1
WATER CONDITIONS	1
FIRES	3
MIGRATORY BIRDS	3
UPLAND GAME BIRDS	14
BIG GAME ANIMALS	14
FUR ANIMALS, PREDATORS, RODENTS, ETC.	14
PREDACEOUS BIRDS	15
FISH	15
PHYSICAL DEVELOPMENT	15
PLANTINGS	18
COLLECTIONS	18
RECEIPTS OF SEED AND NURSERY STOCK	19
GRAZING	19
RESEARCH PROGRESS REPORT	21
RECREATIONAL USES	25
REFUGE VISITORS	25
REFUGE PARTICIPATION	26
FISHING	28
VIOLATIONS	28
OTHER ITEMS	28
ANAHO ISLAND RESERVATION	1A - 6A
FALLON WILD-LIFE REFUGE	1F - 2F
WINNEMUCCA MIGRATORY BIRD REFUGE	1W
COMPOSITION CREDIT AND SIGNATURE	39

I GENERAL

A. Weather Conditions

Summer was a little late in getting started this year, but it was surely hot while it lasted. Our thermometers aren't built to register as high as those at Salton Sea or the Desert Game Range, perhaps, but neither do we have as long to get adjusted to extremely warm weather.

Precipitation continued to be below normal. It has been so long since we have had any rain that the cattle in the hills even have been brought into the feedlots.

	<u>Precip.</u>	<u>Miles of Wind</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>	<u>Mean</u>	<u>Evap.</u>
May	.21	2580.2	89	24	56.7	6.41
June	.02	2635.1	101	30	63.9	7.53
July	.32	1784.0	101	44	73.1	7.77
August	.00	1303.8	98	41	70.1	5.99
TOTALS	.55	8303.1	101	24	66.0	27.70
40 Yr. Av.	1.26	--	99.8	29.2	66.7	31.95

B. Water Conditions

Although precipitation continued below normal for the period, the water outlook is very good. Below is an article of interest to Refuge personnel that appeared in one of the local papers on June 21:

Lahontan at Highest Level In Four Years

May Hit Peak Within Few Days; Near Top of Dam

The 285,920 acre-feet of irrigation water stored in Lahontan Reservoir yesterday was the greatest body of water impounded by the dam since June of 1946.

Four years ago the Carson river, aided by the Truckee Canal, spilled over the top at 291,644 acre-feet.

Yesterday the lake level stood just four inches below the top, represented by 20 inches of flash boards, which will hold back 290,800 acre-feet of water. (Actually the water level now stands 16 inches above the top of the concrete spillways.)

But what was important to Watermaster Harry Richards, more than the amount of water, was the fact that July was almost here—in fact, might be here by the time the lake reaches its peak storage point.

"What's important is how much water is in the lake July of each year," he said.

"This time we may maintain the peak level for a couple of weeks after that, insuring us a good carryover of storage for next year to start with."

There is considerable water to come down yet, Mr. Richards said, adding that the present runoff may hold to mid-July. He stated that the runoff had been longer this season than in several years.

By comparison, it was necessary to "dip into" Lake Tahoe storage last year on June 2. Opening of Tahoe's gates when the normal Truckee flow diminishes below requirements is not expected until at least July 10 this year.

Previous peaks in Lahontan storage came June 1 (too early) last year at 269,092 acre feet; 240,383 on July 1, 1948, and very early in 1947, with 245,744 acre-feet in March.

As will be noted in the table below the usable water storage in the reservoirs that provide storage facilities for the Truckee-Carson Irrigation District, in which the Stillwater Wildlife Management Area is located, show ample stored water:

RESERVOIR STORAGE
As of August 31, 1950
(All figures acre feet)

Reservoir	Capacity	Usable Storage	Ten Year Average
Lahontan	294,400	181,212	168,485
Boca	40,000	32,137	23,158
Lake Tahoe	720,000	438,000	490,800

Lahontan Reservoir, the storage reservoir for the Truckee-Carson Irrigation District has above normal storage for fall and winter use.

Lake Tahoe although below normal for this time of year, has plenty of storage.

A portion of the storage in Boca will ultimately find its way to the marsh area via Truckee River and Canal as this storage is a little high for this time of year and a large carry over cannot be handled.

In summary, the water conditions for the Stillwater Management Area are very favorable.

The Stillwater Point Reservoir with a capacity of 7,000 acre feet had an outflow for the past period of 22,481 acre feet. This figure represents a little more than 70% of the entire amount of water for the marsh area for this period. The balance enters the SWMA through Lead Lake.

Water conditions in the marsh were not normal. Outflow from Stillwater Point Reservoir had to be shut off last winter during the months of January, February and March because of work on canal structures, and, as a result, water levels early in the year were low. Since the start of the irrigation season we have received more drain water than usual, nevertheless, by the time this water became available, loss from evaporation had become great enough to eliminate most of the gain. As a consequence, much of the shallower marsh became dry or very nearly so. The Big Water was greatly reduced in size and retained very little surface water. Much of the "nutgrass" marsh was in the same condition with the alkali bulrush in the northwest part of the area failing to make any growth this year.

This water shortage, occurring when it did, caused some shifting of our nesting waterfowl population but did not result in the loss of any birds. Actually, we derived considerable benefit from the low water. In a number of areas, such as the Big Water adjacent to

the "nutgrass" border, the marsh soil became exposed to the air permitting seed germination, and, as a consequence, we have gained several hundred acres of new alkali bulrush growth. This new cover should be of material value in the botulism danger zone.

Shortly after the first of July our marsh development work temporarily changed the pattern of water distribution and produced some abnormal water levels. The series of Swan Lake Dikes were completed prior to the construction of structures, and the excavation of canals necessary to regulate the water flow. These dikes divide the marsh into two separate portions thus confining the water from the Reservoir to the eastern portion of the marsh and the Paiute Drain and surplus Canvasback Gun Club water to the western portion. This situation resulted in a drop in water levels in the western part. Ponds away from the main channels became low or completely dry, however, the condition lasted for only a brief period and was alleviated as soon as Reservoir water could be diverted through the Swan Lake and Swan Lake Bypass Canals. In the eastern part of the marsh the Reservoir water was confined for a period long enough to produce a flooding of marsh which was nearly dry earlier in the season. This raise in levels was so rapid that action had to be initiated toward diverting the water in order to prevent interference in the marsh construction work.

C. Fires

There were no fires during this period.

II WILDLIFE

A. Migratory Birds

1. Population and Behavior

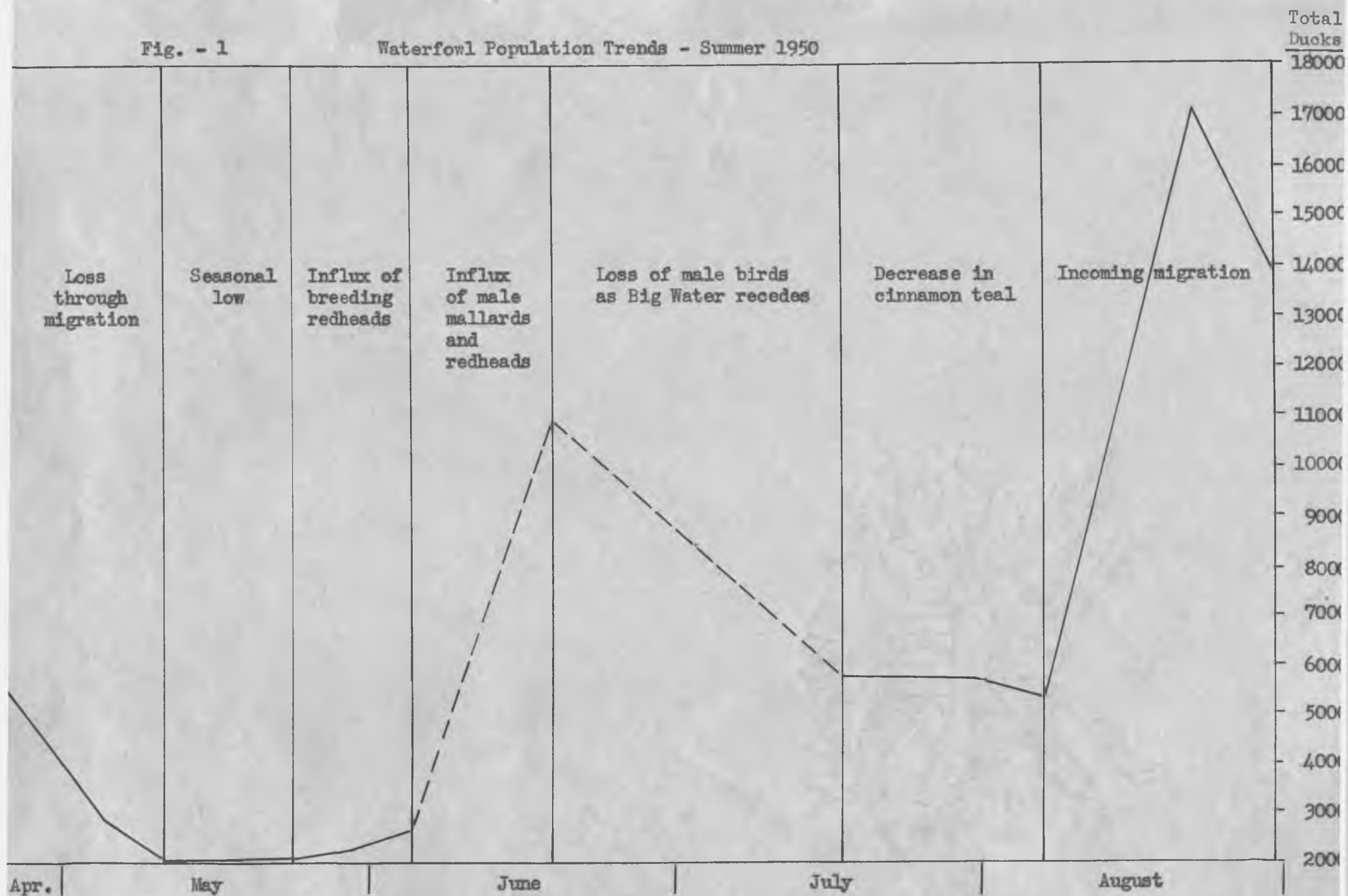
We have attempted to present in Fig. 1 the waterfowl population trends for the summer of 1950. The graph is based on our weekly census data. In order to facilitate an understanding of the trends the graph has been divided into periods each headed with an explanatory note. The population figures are for ducks only; they do not include geese or coots.

Between April 25th and May 11th we lost the last of our spring migrants. During this period some 1,500 green-wing teal plus 2,500 other ducks of miscellaneous species headed north. This loss was only partially compensated by 700 incoming cinnamon teal.

From May 11 to 24 the population was the lowest for the year with only about 2,000 being present. Then, about the latter date, redheads began to appear in increasing numbers. They continued to arrive until maximum numbers were present on June 5th.

Fig. - 1

Waterfowl Population Trends - Summer 1950



Early in June male birds began to gather in large flocks in the nutgrass area and the Big Water. Male mallards appeared first to be followed by male redheads after nesting activities of the latter species got underway. This build-up culminated on about June 19 when 8,000 birds were counted on the Big Water. The majority of these birds came from the nearby fields and marshes of the valley, and two years of observation indicate that it is a normal occurrence for the drakes to gather in this area following the completion of their marital duties.

In 1949 there was no great fluctuation in the number of ducks using the Big Water area from the time of the influx of male birds until the advent of fall migration. This year, however, low water levels created an abnormal situation. There was insufficient water in the marsh last spring to provide a reserve against summer evaporation and by the latter part of June the Big Water and nutgrass areas were nearly dry. Consequently, the birds began leaving the Big Water after June 19 and by July 13 this section of the marsh was devoid of all but shorebirds.

Between July 18 and August 7 we noted a further decline in the waterfowl population due almost entirely to the loss of a large part of the cinnamon teal population, presumably through migration.

On the weekly census of August 15 large numbers of new migrants were noted. During the preceding week the population had jumped from 5,350 to 10,950 ducks. The new arrivals included mallards, gadwall, baldpate, pintail, green-winged teal and shovellers. A week later, August 22, the population had climbed to 17,125.

The downward trend between August 22 and 30, indicated in Fig. 1, represents dispersal into the grain fields of the nearby farmland. It is safe to say that most of these waterfowl continue to use the Stillwater marsh at night. Heavy evening flights into the marsh have been noted but are not reflected in our census data.

The first migrant Canada geese were noted on July 22. Prior to that time our population had built up from the original 15 nesting pairs to about 425, but this probably represented a congregation of local non-breeding geese rather than a migratory trend. Our census for July 22 revealed 800 geese. This figure increased until August 14 when a peak of 2,800 was observed. Since that time total numbers have decreased, but numerous flocks have appeared in the local alfalfa fields indicating that the geese are still in the vicinity.

Although breeding population studies made in 1949 left much to be desired, we have no reason to believe this year's nesting population was different from last year's. This year, with a much better knowledge of the area and an excellent cover map, it was possible to make a reasonably accurate estimate of the nesting population. The location and numbers of nesting pairs of ducks on the Stillwater marsh was established by use of colored map tacks placed on a 5 inch

to the mile scale cover map which was mounted on a sheet of celotex. Each tack represents the location of a nesting pair with each species being designated by a tack of a distinctive color. In some instances the location of a nesting pair was established on the basis of one observation only, though in many instances additional observations were possible.

Fig. 2 - NESTING PAIRS ESTIMATED ON THE AREA IN 1950

Species	Stillwater Marsh	Indian Lakes	Total
Canada Goose	15		15
Mallard	70	30	100
Gadwall	125	75	200
Pintail	12	8	20
Baldpate	2	8	10
Cinnamon Teal	320	20	340
Shoveller	10	5	15
Redhead	640	10	650
Ruddy Duck	30		30
Coot	<u>1,490</u>	<u>10</u>	<u>1,500</u>
Totals	2,714	166	2,880

Unfortunately some parts of the marsh were not completely checked and consequently some pairs were left off the map. Even in areas that were closely checked, we feel our observations were not 100%, but closer to 75%, of the birds present because of the dense cover in the marsh.

Our completed map supplied us with two pieces of information, an estimate of the number of nesting pairs and an excellent picture of what parts of the marsh were productive and what parts were unproductive. The latter information will be valuable in the future plans for management. The former in our opinion is the most accurate way possible to determine the nesting population.

For the next narrative we expect to have a supply of small scale maps on which we can reproduce the nesting pair map. For the present it will be necessary to put into words what the map shows. Fig. 2 shows the nesting population data as determined from the map.

As for the sites chosen by the birds for nesting territory, the map shows that of 13,000 acres of marsh having emergent vegetation, 50% is unproductive of ducks and geese. Most of this 50% is in vast areas. The largest makes up the inner pond and marsh of the Lead Lake, Millan's Channel, Willow Lake and Swan Lake areas. These areas are characterized by heavy growths of cattail and deep water ponds which are devoid of aquatic growth. This area thus lacks proper nesting cover, loafing sites and food. The second large unproductive space consists of a dense cattail growth in the southern part of the Nutgrass Unit. Scattered elsewhere throughout the Stillwater marsh

are smaller unproductive areas. The map further shows that nesting was concentrated around ponds adjoining the mainland. It is interesting to note that this is where grazing is the heaviest, and grazing was a factor in preventing some of these ponds from growing up. On the other hand, we do not infer that the birds used the outside perimeter of the marsh because of grazing. Rather it was because these ponds are shallow enough to support sago pondseed, and often contain hardstem bulrush and alkali bulrush instead of cattail. Also many of these ponds have open shorelines which allow mallards, gadwall and teal access between the shore and open water. Cinnamon teal used the band of open water between the saltgrass and ~~open water~~ in the Lead Lake area. *Cattail*

Coots were not included on the map, as it was too difficult to determine which coots represented breeding birds and which ones were non-breeders or breeders outside their territory. Unlike the ducks, coots utilized the entire marsh.

In addition to the Stillwater marsh, the Indian Lakes section was a waterfowl producer. The table shows the numbers of birds using this area.

Some lakes of the Indian Lakes group were heavy producers. Others produced nothing. Again production here could be correlated with the food supply. Some ponds of the Indian Lakes have a border of Juncus and turbid water which lacks aquatic growth. Obviously there was nothing to attract a duck here. A second type of pond has a border of three-square (Scirpus americanus) and clear water with heavy growths of sago pondweed (Potamogeton pectinatus) or wigeongrass (Ruppia maritima). Ponds of this type had the heaviest waterfowl production for their size of any on the Stillwater Area. Very little emergent growth in the way of cattail or hardstem bulrush is present in the Indian Lakes. This accounts for so few redheads using this area as opposed to the Stillwater marsh.

On the basis of total marsh acreage the Indian Lakes had a nesting population, based on pairs of ducks observed, of one pair per 3.6 acres. In contrast to this we found only one pair per 7.4 acres in the Stillwater marsh. If we eliminate the marsh acreage which is known to be non-productive we arrive at an estimate of a pair of ducks to 1.2 acres in the Indian Lakes and a pair for each 2.4 acres in the Stillwater Area. During the brood census period a total of 25 broods were observed, at one time, on a 53 acre seep pond in the Indian Lakes. This particular pond is illustrated in the pictorial section (M-132).

Since the Pelican Island marsh was all but dry during the nesting season, no nesting took place there.

Canada Goose. Only about 15 pairs of Canada geese were found, and our limited data indicate that production was poor. Between April 24 and May 11 we found 6 Class I broods, possessing an average of 3.8

young. Later observations, limited to 3 broods of Class III age, indicated a survival of only 2.3 birds per brood. One dead Class III young was found.

Mallard. Production figures for this duck are the only ones which provide what might be considered a normal survival pattern. Our records for other species are either: (1) too limited for accurate Class III data, (2) include counts of Class III young involving congregations of broods, or (3) consist of atypical Class III broods.

The average size for Class I mallard broods was 8.2. This dropped to 6.6 for Class II broods, and 5.8 for Class III.

Class I broods were observed only during the period between May 11 and May 24, however, a record of a Class II brood on July 6 indicated that some nesting, at least, extended into June.

Gadwall. Most of our data on gadwall production came from the Indian Lakes. In this area nesting was concentrated on one pond where the absence of emergent growth permitted excellent observation. Hatching of young extended over a fairly long period, the first brood (Class II) being observed on June 30 and the last Class I brood on August 7. All data were plotted on a graph, but, except for a clearly defined peak of Class II broods appearing on July 12, the production curves were not definitive.

The average Class I brood numbered 8.9. Class II broods contained an average of 6.7 young. Only one individual Class III brood, with 8 young was found, though, on another occasion, considerable time was spent without avail trying to divide a compact group of 4 hens and 17 Class III young.

Pintail. Production of this species is inconsequential. Only 4 broods from an original estimate of 20 nesting pairs were observed.

Baldpate. The finding of baldpate broods constitutes a new record for the nesting of this species in this part of Nevada. At least 10 pairs were present and 4 broods (all Class II) were observed. These broods were seen on July 10 and 12 on the Indian Lakes.

Cinnamon Teal. The production of this bird is extremely difficult to evaluate. Breeding pairs occur in considerable numbers in the marsh and a proportionate number of drakes are to be seen after nesting starts. Yet the number of broods to be found is far less than might be expected. This same difficulty was experienced also in 1949. It is possible that the birds are unusually shy. Their distribution seems to be restricted to small ponds with dense cover so that the probable explanation is that we simply do not see the young.

Of the 22 broods of all classes seen, 21 were known to be different, and these do not constitute an adequate sample of the population. Class I broods averaged 4.5 young; Class II broods, 6.6;

and Class III, 5.1. What can you do with such data?

Shoveller. Another unimportant nesting duck. Fifteen pairs were estimated to be present and only 2 broods were seen.

Redhead. Next to the coot, the redhead constitutes our most abundant of nesting waterfowl. Breeding redheads were about as numerous as all other nesting ducks combined. Broods averaged smaller than last year, however, mortality seems to be light. A comparison of our data for the two years is as follows:

	<u>Class I</u>		<u>Class II</u>		<u>Class III</u>	
	No. of Broods	Average Size	No. of Broods	Average Size	No. of Broods	Average Size
1949	52	7.3	5	4.2	7	2
1950	75	5.1	64	4.4	11	5.3

The first Class I redhead brood was observed on June 2. Following that date only an occasional brood was seen until the first of July when young ducks suddenly appeared all over the place. A peak was reached about July 7 after which the number of Class I broods dropped off sharply. The last brood of this class was observed on August 1. The peak of the Class II broods came exactly 2 weeks after the peak for Class I, on July 21. Little can be said for Class III broods. About all that is ever seen of these birds is tail feathers as they disappear in the "tules". Our Class III data is probably distorted by the inclusion of brood congregations.

Production of young redheads reaching flight stage is estimated to be about 1,800.

Almost the entire redhead population, both young and adults, left the marsh between August 7 and 14. Young redheads fly at the age of six weeks. Going back six weeks from August 12, we reach July 1, the day when redhead broods were suddenly seen all over the marsh. It appears as though young redheads leave the marsh just as soon as they can fly.

Ruddy. Our summer population of ruddies was 300, but most of these were loafers which congregated on one pond in the Indian Lakes. Only about 20 pairs seemed inclined to assume the responsibilities of family life. This was also the case in 1949. A total of 6 broods was seen, and estimated production was set at 75.

Coot. At long last we can get down to production figures. We have certainly been successful in raising coots. We started the summer with approximately 3,500 of these birds. This figure went unchanged for some time, though, for a period, the numbers which could be observed diminished as half of the adults assumed the confinement required during incubation. Later, we saw young coots,

though, very few broods were recorded, for normally only one or two of each brood is visible, the others remaining concealed within the cattail or tule growth.

Finally we awoke to the fact that our coot population data needed revising. Coots in adult plumage suddenly began to congregate on all of the larger ponds and lakes in large numbers. A census devoted particularly to the coot revealed the presence of some 10,000. We could feel proud of this contribution to waterfowl production if more hunters were acquainted with the gastronomic possibilities of this neglected species.

Fig. 3 - COMPILATION OF BROOD DATA

Species	Broods			Total Broods*
	Class I	Class II	Class III	
Canada Goose	6	0	3	6
Mallard	5	7	6	12
Gadwall	16	23	1	37
Pintail	1	1	2	4
Baldpate	0	4	0	4
Cinnamon Teal	6	9	7	21
Shoveller	1	1	0	2
Redhead	75	64	11	94
Ruddy	4	1	2	6
Coot	24	16	3	26

*Estimate of total broods is minimum in some cases. Any broods which might have represented duplication were omitted.

Fig. 4 - WATERFOWL PRODUCTION

Species	Nesting Pairs	Estimated Broods	Total Production
Canada Goose	15	12	25
Mallard	100	75	425
Gadwall	200	150	875
Pintail	20	15	75
Baldpate	10	8	50
Cinnamon Teal	340	100	500
Shoveller	15	12	40
Redhead	650	450	1,800
Ruddy	20	15	75
			<u>3,840</u>
Coot	1,500	1,000	4,000

Fig. 5 - NUMBER OF WATERFOWL BROODS AS SEEN IN VARIOUS COVER TYPES IN STILLWATER MARSH ALONG WITH TOTAL ACRES OF EACH COVER TYPE PRESENT.

Species	COVER TYPE				No Cover
	Typha 3960 A.	Scirpus acutus 460 A.	Scirpus paludosus* 1075 A.	Distichlis stricta 1730 A.	
Canada Goose	2	7			
Mallard	3	2	3		1
Gadwall	4	7			1
Pintail	1	1			
Cinnamon Teal	6	7	1	2	1
Shoveller				1	
Redhead	45	79	15	2	3
Ruddy Duck	2	5			
Coot	<u>28</u>	<u>10</u>	<u>4</u>	<u>1</u>	<u>—</u>
Total	91	118	23	6	6

*Scirpus paludosus rates unusually low since most of this type was not under water this year.

Grebes. Several pairs of eared grebes nested in the Indian Lakes on floating piles of sago pondweed. Their young first appeared on August 7. Young Western Grebes were occasionally seen throughout July and August in the deeper ponds of the Stillwater marsh. Pied-billed grebes were heard often during the summer from the dense vegetation of the Stillwater marsh. One nest with six eggs was found in a pile of wet and rotting hardstem bulrush on May 12.

Pelicans and Cormorants. White pelican numbers declined rapidly in May, from 1,500 to about 500 birds present at any one time. These are undoubtedly birds from Anaho Island at Pyramid Lake. Double-crested cormorants were seen in small numbers through the summer. These birds also probably represent part of the Anaho Island population.

Hérons and Ibis. On May 19 additional nesting territory was found in the heron rookery reported in the last narrative report. This find increases our estimate on the number of birds using the rookery. As reported in the last narrative, the colony was spotted from the airplane on April 24 in the north-central part of the Stillwater marsh. It is situated in a 20 acre stand of hardstem bulrush, Scirpus acutus, which is surrounded by a band of cattail, Typha angustifolia. The table shows the number of nests found, the number of nests estimated to be present and estimated production. Estimated production was based upon the average clutch in the nests found.

HERON ROOKERY

	<u>No. Nests Found</u>	<u>Estimated Nests Present</u>	<u>Av. per Clutch</u>	<u>Estimated Production</u>
Blue Heron	122	155	3.85	600
Night Heron	605	964	3.61	3,480
American Egret	4	6	5.00	30
Snowy Egret	102	168	3.02	500
Glossy Ibis	<u>3</u>	<u>5</u>	6.00	<u>30</u>
Totals	836	1,298		4,640

IBIS ROOKERY

	<u>No. Nests Found</u>	<u>Estimated Nests Present</u>	<u>Av. per Clutch</u>	<u>Estimated Production</u>
Glossy Ibis	25	25	Unknown	125

These tables do not account for mortality. Because of the dense growth present, it was not possible to make a 100% coverage and find every nest.

The number of white-faced glossy ibis using the rookery may have been somewhat larger than shown, as these birds were the last to nest and most of the rookery was checked before ibis nesting was in full swing.

A small rookery consisting of 25 ibis nests was found in the old nutgrass area on July 14. This rookery was in a stand of hardstem bulrush adjoining isolated 50 acre pond. At the time of the visit, nesting had already been completed. Four dead young were found. About 50 adults and young of the year were using the old nests for a roosting place.

Ibis also nested on the Canvasback Gun Club. The club is on private ground within the boundary of the Management Area. Because of its being on private ground, the birds from this rookery are not figured in the Management Area population. We did not visit the Gun Club rookery, but according to outside reports, probably several hundred ibis nested there.

Gulls and Terns. As with last year, Caspian terns nested on the small bare island in the Stillwater Point Reservoir. This time, however, even more terns used this island and California gulls used it for the first time. A total of 120 Caspian tern and gull nests

were present, a rather large number considering the island is only one third of an acre in size. The island was visited on June 2 and again on July 31. Incubation and egg laying was in progress on June 2. On July 31 the young birds could swim and a few could fly. The 107 tern nests as noted in the table is a notable increase over the eleven nests found on June 15 of 1949. The July visit showed that nesting success was not high, as only 60 young terns and 7 young gulls were seen.

	No. Nests	Av. Clutch*	Est. Prod.	No. Reach Maturity
Caspian Tern	107	1.86	200	50
California Gull	13	2.17	28	6

*Egg laying not complete.

Several pair of California gulls also nested on the island in the Big Water.

A Forester's tern colony was not found this year, but young were seen on August 1. Last year a small colony of these birds was found nesting in the Nutgrass Area at a location that remained dry this spring.

Black terns undoubtedly nested on the area also.

No ring-billed gulls were known to have nested on the Area. These birds did not appear until August.

Shorebirds. The usual avocets and black-necked stilts nested on the Area. Young avocets first appeared on June 5. After the nesting season these birds congregated along the edge of the Big Water and in the new growth of alkali bulrush extending out from the old nutgrass area. Wilson phalaropes were found nesting on the Area for the first time in the Pelican Island marsh. Snowy plovers probably nested along the edge of the Big Water.

The end of May saw the last of spring migrating dowitchers, least sandpipers, western sandpipers and marbled godwits. Hardly had these birds left before the fall migration brought back these same species in July along with up to 11,000 Wilson phalaropes. Shorebirds concentrated in largest numbers along the edge of the Big Water. Unusual to rare observations include six semipalmated plovers seen on May 11; 10 black-bellied plovers on May 16 and two knots on May 16.

2. Food and Cover

Beginning in April and extending through July, 75% of the

Nutgrass Area became dry. This situation reduced the available nesting cover for the redhead. During the same period about 60% of the Big Water reached a dry state. Inasmuch as the Big Water offers little or no cover, nesting waterfowl were not affected by the reduction of food here. After the nesting season, the dry state of the Nutgrass Area and Big Water obviously reduced the amount of waterfowl food available, but an ample supply of food elsewhere prevented any shortage on the Stillwater Marsh.

Other than the Big Water and Nutgrass Areas, food and cover conditions were normal. Sago pondweed (Potamogeton nodosus), wigeongrass (Ruppia maritima), nutgrass (Scirpus paludosus) and hardstem bulrush (Scirpus acutus), the principle food plants of the Stillwater marshes, produced good crops of seed. Low water in July at the north central and northwest part of the marsh created suitable conditions for an unusually good growth of dwarf spikerush (Eleocharis parvula). Most of the Stillwater marsh thus had ample food except in the old part of the marsh, that is, in the Lead Lake, Millan Channel, areas, where the combination of deep and muddy water and possibly other factors prevent submerged growth. Cattail is the only emergent found in abundance in this area.

Other than the Big Water and the west side of the Reservoir, the Stillwater marsh has more than enough cover. An overabundance of cover is one of our problems.

White pelicans and members of the heron family had available, as usual, plenty of carp, other fishes and various tadpoles. Animal life in the mud along the edge of the Big Water provided ample food for shorebirds.

Heavy grazing and a shortage of water prevented emergents from going to seed in the Pelican Island marsh. Consequently submerged plants provided the only water fowl food. No nesting cover was available here.

Food conditions were normal in the Indian Lakes. Waterfowl food is absent in some of these lakes. Other contain heavy growths of sago pondweed and wigeongrass along with stands of three-square (Scirpus americanus) on the edges. Most of these lakes lack emergent growths of cattail or hardstem bulrush for cover.

3. Botulism

No botulism occurred during this period.

4. Lead Poisoning

Only one case of lead poisoning was observed during the period. On August 24, a dead immature male mallard was found on the north

side of the marsh. As the carcass was fresh, it was opened for post-mortem examination. The gizzard contained 17 lead shot. Varying degrees of wear on the shot indicated that they had been picked up over a period of several days.

B. Upland Game Birds

Valley quail were occasionally seen along the edges of the Management Area adjoining farmland.

C. Big Game Animals

Our first actual record of big game animals was made on May 29 when 3 deer were observed on the east side of the marsh in the vicinity of the Nutgrass Unit. Deer have undoubtedly come down from the Stillwater Range in the past, but there are so few in the hills adjacent that they are seldom seen.

D. Fur Animals, Predators, Rodents and Other Mammals.

1. Fur Animals.

A. Muskrat

Sign made by this furbearer during the summer is not too conspicuous, but there is considerable evidence to date indicating that muskrats are not only increasing but are also spreading to occupy parts of the marsh which have been vacant. If our fall census fulfills our present expectations we should be able to permit some trapping this fall.

B. Other Furbearers.

So far as is known our population of other furbearers consists of two badgers, one was seen on the West Food Plot Unit on several occasions throughout the summer, the other found on the east side of the Big Water.

2. Predators

There has been some coyote reproduction in the marsh area, but the population is still very low. One litter of young was raised in the vicinity of Stillwater Point Reservoir - on two occasions a pup has been observed near the service building.

Last year coyotes were active in the vicinity of the Big Water scavenging on the carcasses of waterfowl that had died from botulism. So far this season we have failed to note any such activity. Apparently, there are few, if any, left in this particular area.

3. Rodents

Jackrabbits are near the peak of the cycle, though they are not noticeably abundant on the Management Area. Drought conditions during the past few years probably have not been conducive to any great population increase. Recent reports indicate that there has been a fairly heavy die-off in the nearby mountain areas which is attributed to tularemia.

E. Predaceous Birds

As normal, predaceous birds made little use of the Area. One or two ravens were sighted on several occasions, and two flocks of magpies numbering about 30 birds each were seen in August. A prairie falcon was seen twice. Swainson's and marsh hawks are our only common hawks; but they cannot be considered predators. The Swainson's hawks are seen along the Carson River and Indian Lakes where there are trees. The marsh hawks are common in the Stillwater marsh.

We cannot expect predaceous birds to be a problem in the Stillwater marsh for the present, as there are no perching places for them in the way of trees, cliffs, buildings or posts. Fencing could bring in a few of these birds.

F. Fish

Conditions for fish through this period were below last year's standards. With no spring runoff from the Stillwater range the marsh started out with low levels in the spring. Irrigation drainage began to increase in April and through the balance of the spring and summer the marsh remained about constant in level.

Lower marsh water levels resulted in higher water temperatures but there was no evidence of loss of fish.

III DEVELOPMENT AND MAINTENANCE

A. Physical Development

Working conditions through the period were good to excellent. Lack of precipitation, only .55" for the period, was reflected in a deterioration of work roads. Soil pulverized and dust was deep and roads rough. Wind in May and June made working conditions disagreeable at times but did not slow progress down.

The crew remained at approximately 8 men until June 19th when available funds provided for an increase in personnel. Notice of approval of the State Fish and Game's PR Project was received the week of July 11 and full operations started on July 17th.

✓ East Waterfowl Food Plot. The small crew, May 1 through June 17th continued work on the East Waterfowl Food Plot area. The size of the concrete crew was increased after the first of the fiscal year.

At the close of the report period all structures in Laterals 294, 314 and 336 were completed except for backfilling and installation of flashboard slots and flashboards. Water can soon be turned into the western portion of this area to start leaching the soil preparatory to seeding.

Hunter Road. With the balance of job funds available, the crew was enlarged in mid-June and work started on the unfinished portion of the Hunter Road. Eighty-four hundred feet were knocked down, graded and gravelled. This work continued on into mid-July. With the savings in State funds that was effected here a supplemental proposal was made, and approved, to gravel an additional portion of the Hunter Road previously sanded, this work is being saved for winter. Necessary maintenance work for construction use was done on the Hunter Road, the Navy Cabin Road and the gravel pit road.

Swan Lake Dike (SL Series). Work was started on this in mid-July to provide access to the Pintail Bay and Nutgrass Dike construction sites. Emergent growth was stripped from water areas and necessary fills made. Grading of roads across the tops of islands progressed rapidly and by the first of August access from the south side of the marsh to the north side was possible. Work that remains to be done on this is bringing the fill up to final grade.

Pintail Bay Dike (PB Series). By the end of the report period the elevating grader had nearly completed approximately 6,900 feet of the south and west ends of this dike. Stripping of emergent from a narrow water area near Structure 16 was accomplished with the P&H dragline and a fill pushed across with trucks later.

Swan Lake Canal. This canal 18 feet wide was completed except for the land block that was left for the construction of Structure 5.

Swan Lake Bypass. The western two-thirds of this canal was completed up to the site of Structure 5, the eastern one-third remains to be done. Most of the work on the Swan Lake Canal and the Swan Lake Bypass necessitated the use of mats for the draglines.

Dike D. The fill for this dike was approximately ne-half completed by the Lorain in making its first pass across the Foxtail Channel. This completely cut off the Foxtail Chammel flow to the Nutgrass area. The return trip across the Channel by the dragline should nearly complete the fill. In the deepest place water was 18" deep on the dragline mats.

Headquarters Plot Fence. Early in the report period the 8 foot industrial fence around the headquarters plot was completed. Materials, supplies, tents, the gas and diesel tanks and other equipment were moved from Greenwood's lot in Stillwater to the newly enclosed headquarters plot.

Engineering Works. Engineering personnel was furnished the

engineering section for laying out 1951 fiscal year's work program and for the topography survey of the Paiute Waterfowl Food Plot area.

Material Transfers. Two trips were made to Pt. Mugu near Los Angeles, California, and loads of construction material returned to Fallon from there.

Tamarisk Control. One of the problems inherent in the Stillwater marsh is tamarisk control. This exotic has been planted throughout the valley and is continually spreading via the irrigation system. It has only been quite recently that we have recognized the full extent of tamarisk growth in the marsh area. Most of this growth is new, consisting of seedlings established in the past two years, and it does not show up except on close inspection of the marsh edges. The young plants are almost completely obscured by the border growth of alkali weed and foxtail barley.

The biggest problem area is Stillwater Point Reservoir and the channels distributing the Reservoir water. This water system is comparatively new, dating back to 1945, and the banks, still sparsely covered with other vegetation, have offered a fertile field for tamarisk invasion.

Tamarisk is widely distributed throughout the other parts of the marsh, but usually occurs only as individual, or small groups of plants. There is, though, a considerable growth in the Indian Lakes area particularly about one of the ponds receiving water from the Shoffner Drain.

Measures to control this pest were initiated during this period. A combination of tractor power, hand labor, and 2,4-D was used to reduce or eliminate a stand of about 5-1/2 acres along Foxtail Channel and a border strip about 1 mile in length along the Reservoir. The first plants to become established in the control area had formed a hedge approximately 1-1/4 miles in length along Foxtail Canal. One day was spent in pulling the largest of them with an Allis Chalmers HD-14 and cable. Later the smaller plants were sprayed with 2,4-D.

Between Foxtail Canal and the East Canal much of the ground is wet from subirrigation. In this area we had an estimated 5-1/2 acres of tamarisk consisting of plants of various sizes from new seedlings to bushes 6 to 8 feet in height. In some spots the ground was literally covered with thousands of tiny plants, otherwise the plants were inclined to be scattered. Since most of the plants were young it was believed that the application of 2,4-D might be effective. Accordingly, we assembled a spray rig by using a 10 gallon paint pot, 100 feet of hose and a spray nozzle. Air pressure was obtained from a diving compressor. This rig was used from the back of a jeep pickup truck.

The ester of 2,4-D was applied on June 12 and 13. The rate of

application was approximately 3.5 lbs. per acre. Individual plants, particularly the larger ones, were wet thoroughly in order to insure maximum absorption.

During the spray operations we also covered the marginal growth along the Reservoir for a distance of approximately one mile. Most of the tamarisk here was sprayed, however, for at least 200 yards the edge was too wet to get the jeep within spray range and the plants were removed by hand.

Results of the spraying, at this date, cannot be considered conclusive, nevertheless, the reaction of the plants to the 2,4-D was encouraging. Wilting was noticeable on the day following the application, and by the end of the first week, the leaves had assumed a grayish cast while the tender growing tips of the branches were twisted and curled. A week later most of the leaves were shed; those which remained being brown. By then the wood core of the smaller branches had a dark appearance.

After a period of six weeks some basal sprouting was noted, but this was confined to young plants growing in stands of foxtail barley which partially shielded them from the spray. No new growth has, as yet, been observed on those plants which received 100% coverage. Present recovery is less than 1%.

Material Purchases. At the close of the report period, 2,500 sacks of Type V cement and 30,000 pounds of steel were on hand. Bids were out for bridge decking, flashboard timber, bolts, lumber and other necessary materials adequate to complete the year's work program.

B. Plantings

There were no plantings during the report period.

C. Collections

2. Specimens

To follow is a list of birds taken under permit on the Area. Most of these were taken to establish scientific records that cannot be disputed. Study skins were made of birds collected in all instances except one, in which case it was necessary to preserve it in formalin. At the present time these records are being written up for approval so they can be published in The Condor, the ornithological journal of the Cooper Ornithological Club.

Snowy Egret. An adult was picked up dead on May 19th and made into a study skin.

Baldpate. A young baldpate going from the Class II stage to Class III was taken from a brood of eight in the Indian Lakes on

July 12th. To the best of our knowledge, this is the first record of this bird breeding in this part of Nevada.

Bufflehead. A male going into fall plumage was collected in the Indian Lakes on July 12th. This bird was shot to establish the first known record of the bufflehead's presence in summer in Nevada.

Sora. A sick individual was taken beside the East Canal on May 18th.

Semipalmated Plover. One was collected in the Indian Lakes on May 8th to establish the second spring record for the species in Nevada.

Black-bellied Plover. A male was taken from a flock of 28 near the Navy Cabin on April 10 to establish the first known spring record of the species in Nevada. This collection was overlooked at the time the last narrative was written..

American Knot. One of two present at the north end of the Nutgrass Area was taken on May 16 to establish the first record of this species in Nevada. The specimen was sent to Mr. Stanley G. Jewett who made positive the identification made here.

D. Receipts of Seed and Nursery Stock

No seed or nursery stock has been received during this period.

IV ECONOMIC USE OF REFUGE

A. Grazing

Additional work has been done on the preparation of a grazing plan during this period. We expect to complete this plan in the near future. As mentioned previously, grazing cannot be completely controlled until the area is fenced. Control will be complicated by large blocks of unfenced private lands located within the Area.

Livestock numbers using the Area during the report period ranged between 400 and 600 head. About 125 of these animals were horses, the remainder being cattle. The Pelican Island area supported nearly half of these animals, there being present there between 150 to 250 head of cattle and 100 head of horses. The Indian Lakes accounted for about 150 head. In the Stillwater marsh livestock numbers stood at about 70 until the latter part of July when lack of forage at Pelican Island and in the Stillwater Range ran cattle numbers up to almost 200.

The Stillwater marsh was grazed lightly in view of the available forage and use during previous years. Quite probably more grazing

would have done more good than harm to the marsh. During April, May and June, the animals grazed upon the new growth of cattail. In July and August they grazed upon alkali weed (Echinopsilon hyssopifolium), alkali bulrush (Scirpus paludosus), saltgrass (Distichlis stricta), and hardstem bulrush (Scirpus acutus). Shoreline adjoining the mainland received most of the use. The animals did not go far from shore nor did they cross deep water to reach many of the islands in the marsh.

Little to no livestock use of the island shorelines as opposed to more heavy use of shoreline vegetation along the mainland has provided a comparison of conditions under various degrees of use. Saltgrass on the islands remains high as compared to heavily grazed saltgrass along the mainland. Despite this fact, nesting density is actually lower along the islands than along the mainland.

Along about 50% of the mainland in the older part of the marsh a zone of open water is present between shoreline saltgrass and cattail. This zone is kept clear of cattail by the livestock and elimination of spring grazing would eventually mean the giving up of this open water zone to cattail. Around the islands in the marsh, where grazing has been zero to light, cattail extends to the saltgrass. Unlike the ponds at the inner edge of the cattail, the zone of open water along the mainland is clear enough to support sago pondweed. Cinnamon teal use this zone heavily during the nesting season and all other surface feeders, particularly mallards, use it during the fall and winter. This is one of the main factors which accounts for heavier waterfowl use of marsh adjoining the mainland.

Livestock grazing in the north central part of the marsh has been detrimental to waterfowl in shallow water ponds by clipping seed heads from the alkali bulrush. Alkali bulrush seed heads have been entirely eliminated from several of these ponds.

Grazing so far this year has not been extensive enough to cause livestock to enter the heart of the nutgrass area where a dense stand of alkali bulrush needs to be opened up.

The Indian Lakes section was grazed moderately to heavy. Saltgrass, spikerush and wire rush were the principle shoreline plants grazed. Some three-square (Scirpus americanus) was also taken. Despite the grazing, two of the Indian Lakes had the highest nesting density anywhere on the Area. Cattail and hardstem bulrush is almost totally absent from the Indian Lakes because of heavy grazing and the newness of the Lakes.

The Pelican Island Area was grazed to the absolute limit of the forage present. A shortage of water here along with the grazing has kept hardstem bulrush and alkali bulrush growth from reaching but several inches in height.

No grazing took place on the desert this year except around the edges of the Indian Lakes. The lack of rain kept desert shrubs from leafing out except where these plants were supplied with ground water next to water areas. Herbaceous plants and Indian rice grass failed to make any growth.

V FIELD INVESTIGATION AND RESEARCH

A. Progress Report

1. Marsh Study Plots

In addition to the vegetation study plots established last year, new quadrats and transects were set out on August 10th, this period.

In rechecking the plots established last year we were somewhat surprised to note that the saltgrass border along Foxtail Lake had extended seven feet farther inland while the cattail zone had moved ten feet farther into the lake. Since this is a comparatively new water body, plant invasion is still actively in progress.

2. Turbidity Studies

All of our field observations since the start of the Stillwater project have indicated that waterfowl make little use of the west portion of the marsh except for a few of the shallow, marginal ponds. The reasons for this lack of utilization are recognized. The ponds are comparatively deep and turbid, they lack aquatic growth, and are surrounded by wide zones of dense cattail. Since they produce no food and possess an undesirable type of cover, they are not used by waterfowl to any extent at any season of the year.

Even though the major factors which influence waterfowl distribution in the marsh are known, we have, for some time, felt the need for a more basic information concerning these factors.

Marsh management must be founded upon an understanding of the principles underlying both cause and effect.

Lack of aquatic growth in certain areas such as Lead Lake, Millan Channel, Willow Lake and Swan Lake apparently is attributable to excessive turbidity. These waters are noticeably dark at all times of the year. They are also the deepest waters of the marsh but are well within the depth tolerance of such plants as sago pondweed. In order to determine just how much darker they are than other ponds producing sago, we started making water clarity tests the latter part of July. Various stations were established in the marsh and comparative readings were made with a Secchi disk. This instrument consists of a circular disk 8 inches in diameter which is divided into quadrats painted alternately black and white. The disc is lowered into the water until it disappears from sight and this depth is recorded. The readings obtained are comparative only and

indicate light penetration. They are not a measure of turbidity since such a measure is based on the quantity of suspended matter in the water.

In so far as the work schedule permits, we expect to repeat the water clarity readings at monthly intervals.

Our initial findings in this investigation are of considerable interest. They do not present any clear-cut pattern as one might expect, principally because high winds prior to the time the disk readings were made had roiled much of the open water, but they did provide some basis for ascertaining the factors involved.

It appeared, for example, that the character of the marsh soil is responsible for most of our turbidity. This soil is fine-grained silt, combined, in older parts of the marsh, with particles of organic material. Only slight water movement is required to stir it up after which it remains in suspension for long periods of time. We collected bottom samples at 10 of the stations, mixed them thoroughly with measured quantities of tap water and then recorded settling time. Heavier particles in the samples settled out in stratified layers. The time required for the complete deposition of these particles varied from 5 hours to 18 hours and 15 minutes. Even after this lapse of time the water did not become clear. It retained a gray, or brown, color, depending upon the amount of organic material present, for an indefinite period of time. Six of the samples were kept under observation for 24 hours while 4 were held for 48 hours with little perceptible change in color. This coloring material seems to be largely colloidal matter plus more or less organic stain. A water sample from Stillwater Point Reservoir retained most of this finely suspended material for a week and was still noticeably colored at the end of 2 weeks. ✓

Secchi disk readings were made in the Stillwater marsh and the Indian Lakes. Additional readings were also taken on the Canvasback Club since the overflow from the Club provides the major source of water for the western portion of our marsh. Our most turbid water occurred in the Reservoir distribution system. This water system is still comparatively new so that a considerable proportion of the channels is still bare of vegetation. For this reason the current is continuously scouring the channel banks and washing new material into suspension.

The clearest open water is found in small ponds which are not connected to the water distribution system by open channels. In other words, small ponds which are not influenced greatly by wave action and which receive water filtered through marsh vegetation are the clearest. The presence of sago or other pondweeds is another factor of considerable influence. Pondweeds bind the bottom soil and not only dampen wave action, but tend to retard the spread of sediment stirred by the action of feeding carp.

In open ponds and channels on the Stillwater marsh the Secchi disk disappeared at depths varying from 4.5 inches to 23 inches. Actually the clearest water occurred in depths too shallow to permit use of the disk.

At the Indian Lakes we obtained disk readings varying from 8.25 to 13.5 inches in those lakes along the water channel. The Indian Lakes also include several seep ponds fed by underground water which are exceptionally clear. In the deepest of these we were able to see the disk on the bottom at 32 inches.

The following factors contribute in some degree to the high turbidity of our marsh water:

1. Silt character
2. Current (in canals, particularly)
3. Turbulence (at structures)
4. Wave action in the larger ponds
5. Carp action
6. Lack of bottom, or bank, cover
7. Temperature (water turn-over)

None of these factors can be eliminated entirely but in some cases it will be possible to take remedial action.

Current in the canals will always be a factor though it will become somewhat less significant as vegetation becomes established along the banks. In considering this factor it is our belief that channels in the marsh proper should be limited to the minimum required for proper water distribution.

A considerable quantity of silt is picked up by water pouring over the structure. This could be reduced by covering the bottoms and sides of the canals with riprap material throughout the turbulent area.

The only feasible method of retarding wave action in the larger ponds seems to consist of establishing emergent plant growth, preferably round-stem bulrush, in belts to serve as wave-breaks.

Carp action will be subject to control in those parts of the marsh where our management will permit dewatering. These fish will be difficult to eliminate, however, as we are subject to continual reinvasion through the irrigation system.

Bank cover along the ditches will appear in due time. The various aquatics, which constitute bottom cover, are present, apparently, wherever conditions are suitable. Improvement in other factors should lead to an increase in the growth of aquatics. Practically all of the shallow ponds on the area are now producing submerged growth, and there seems to be little chance of getting these plants established in the deeper ponds without either lowering

water levels or reducing turbidity.

3. Band Returns

Just as a matter of record, we are inserting a list of the known band recoveries including both banded birds taken in the vicinity of Fallon and birds banded here and recovered elsewhere. As yet we do not have a clear picture of the flight of migrating waterfowl either into Stillwater from the north or from the Stillwater marsh on south to other wintering areas. Eventually the pattern of band recoveries will help provide this needed information.

It is with considerable interest that we note the high percentage of birds recovered here which were banded in other flyways. Of the 12 recoveries recorded, 4 were of birds which, theoretically, should have followed some other flyway. Mallard (3), pintail (10) and shoveller (12) were banded in the Central Flyway; mallard (4) was banded in the Mississippi Flyway.

Fig. 6 - BANDS RECOVERED AT FALLON, NEVADA

Species	Banding Locality	Date Banded	Date of Band Recovery	Band No.
Canada				
1. Goose	Brooks, Alberta	7-19-47	11-14-48	44-821822
2. Mallard	Ruby Lake, Nev.	11-6-47	10-15-48	42-612133
3. Mallard	Prewitt Res., Colo.	2-24-47	11-18-48	44-616261
4. Mallard	Havama, Ill.	12-5-47	10-14-49	47-740609
5. Mallard	Lovelock, Nevada	9-20-49	11-6-49	507-25605
6. Mallard	Reno, Nevada	6-13-46	11-29-49	39-702160
7. Mallard	Sprague, Wash.	11-28-49	1-25-50	506-00320*
8. Mallard	Rupert, Idaho	11-12-49	2-4-50	507-38827*
9. Pintail	LaGlace, Alberta	9-24-47	10-28-48	47-605925
10. Pintail	Eye brow, Sask.	7-18-49	2-27-50	496-56458*
11. Shoveller	Etzikom, Alberta	7-7-48	11-16-48	47-525316
12. Shoveller	Driver, Sask.	8-1-47	10-14-49	47-528151

RECOVERY OF BIRDS Banded ON STILLWATER MANAGEMENT AREA

Species	Locality of Band Recovery	Date Banded	Date of Band Recovery	Band No.
1. Mallard	Sacramento, Calif.	12-31-49	1-7-50	507-25629
2. Pintail	Mosshank, Sask.	3-2-50	7-17-50	496-87184*

* Retrapped birds - Others were shot

VI PUBLIC RELATIONS

A. Recreational uses

See Fishing

B. Refuge Visitors

The following visitors were received in Fallon during the report period:

- May 8 - Harry B. Richards, TCID Watermaster, Canvasback Gun Club inflow discussion - 1 hour.
- May 9 - Lee R. Jacoby, Portland, Engineering work
- May 22 - E. E. Woolverton was in the office inquiring about posts; W. R. Mendes brought us some samples of seed which he was of the opinion that would do well in our Management Area; Mr. Jacoby returned to Fallon for a brief stay.
- May 24 - Frank Groves and C. A. "Hap" Early of the State Fish and Game Commission spent the day on an inspection of the Area.
- May 29 - Harold O. Taber, Washoe County District Attorney, S. S. Wheeler, Nils Nilsson of the State Fish and Game Commission spent the day going over the Pelican Island Area.
- May 31 - Mr. Robert Boone and Mr. Elmo See spent one hour conferring on the work program.
- June 1 - Mr. Boone, Portland and Mr. S. S. Wheeler, Nevada Fish and Game spent the forenoon going over the development plan of Stillwater Wildlife Management Area.
- June 5 - James Sloan, President of Churchill County Fish and Game Unlimited, spent one hour in discussion of the grazing plan and the Fish and Game conference.
- June 5 - S. S. Wheeler spent one hour conferring on the Pelican Island Development
- June 6 - Dr. Clarence Cottam, Central Office; Mr. Paul T. Quick of Portland; Malcolm Allison, Reno and Frank Groves and Nils Nilsson of the Nevada Fish and Game Commission were visitors at our office.
- June 9 - Harold F. West, Construction Engineer arrived for two weeks engineering work in the topography of the Area.

- June 15 - Mr. Harry D. Willis spent one hour visiting in the office on his way to Desert Game Range.
- June 13- Mr. Lee R. Jacoby spent this time at work with the to engineering crew on the Stillwater Wildlife Management Area.
- June 21 - Mr. Willis, Portland, spent 2 hours in the office on discussion of the work program.
- June 27-29- Mr. Boone, Case, Tousey and Fred Anderson, Regional Office spent 2-1/2 days on an inspection of the Stillwater Wildlife Management Area.
- July 17 - J. L. Ruebke, Topographic Engineer and R. D. Mead, Cartographic Aid, U.S.G.S. spent one-half hour on a conference of the roads in the Area.
- July 17-18- Wilfred N. Anderson, Regional Office, made an inspection of the Wildlife Management Area.
- August 4 - Nilsson and Harry B. Richards spent 2 hours conferring on the development program.
- August 8 - H. W. Emery, spent one hour conferring on the water right filings.
- August 21 - Ross Hanson in with plane for trip over area - spent 3 days at Stillwater.
- August 28 - Mr. Wm. Taylor, Central Office, Mr. MacDonald and Lee R. Jacoby of Regional Office spent the day on an inspection trip over the Area.

C. Refuge Participation

The following meetings were attended through the report period.

- May 1 - The Board of Directors held their regular monthly meeting which Mr. Horn attended and discussed the grazing leases which Truckee-Carson Irrigation had with various water users.
- May 12-17 - "Know the Hawk", "Bears in Alaska" and "Pacific Halibut Fishing", were shown to the schools in Fallon during this period which afforded enjoyment for approximately 833 pupils.
- May 15 - A meeting of the Board of Directors of Truckee-Carson Irrigation District, Canvasback Gun Club and interested farmers was held on the Harmon Diversion proposal.

- May 22 - A meeting was attended of the Board of Directors of Truckee-Carson Irrigation District and the Canvasback Gun Club on the discussion of the water right filings which the State Fish and Game Commission and the Service had made on the waste water of the Newlands Project.
- May 25-26 - Attended meeting in Sacramento with Mr. Groves, State Fish and Game Commission, Mr. Quick, Regional Office, LeRoy Giles, Stillwater, and participated in the discussion on equipment rental rate changes.
- June 2 - Attended meeting with the Executive Committee of the Canvasback Gun Club conferring on the Harmon Diversion proposal and the water right filings. This meeting was held at the Club's offices in Reno.
- June 5 - Attended TCID Board meeting and received the specifications for the Harmon Diversion.
- June 5 - Showed the films "King Chinook" and "Alaska Sports-fishing" to the Churchill County Fish and Game Unlimited, - 35 present.
- June 6 - Dr. Cottam, Central Office, gave a talk to approximately 85 interested sportsmen from Fallon and surrounding communities on the status of North American waterfowl illustrated with kodachrome slides.
- June 19 - Spent the afternoon and evening in the Reno office of the Nevada Fish and Game Commission in conference on and preparation of data for the PS&E's for the State's 5-D-2 Project.
- June 21 - Attended meeting at TCID with Phil Hibel and Harry Richards of TCID, S. S. Wheeler and C. A. Early, Jr., State Fish and Game Commission conferring on the State's Pelican Island development.
- July 7 - Showed films "Haunts of the Hunted" and gave brief talk on the benefit of the Refuge to the Sheckler Farm Bureau - 45 present.
- July 27 - Conferred in Reno with Paul Quick, Regional Office, Frank Kent, Central Office, and State Fish and Game officials on the development of Stillwater Wildlife Management Area and Pelican Island Area.
- August 7 - Attended TCID Board meeting and explained the water right filings to the Farm Bureau Investigating committee.

August 12 - Attended conference on Stillwater Wildlife Management to Area in Portland. This meeting was attended by the 21 officials of the Nevada Fish and Game Commission and various Regional Office personnel.

D. Hunting

There was no hunting during this period.

E. Fishing

Bullhead and catfishing continued throughout this report period. Fishermen were enthusiastic about results of catfishing when the Lead Lake, Millan Channel Areas produced many up to seven pounds.

Bullheads, yellow perch and large mouth black bass were taken in considerable numbers from the Indian Lakes area.

Papoose and Big Indian Lakes produced the bulk of the fish with Cottonwood and East Lakes providing some. Estimated catches were:

Species	Man Days	No. Taken	Av. Wt.
Bullheads		6,000	7 oz.
Yellow Perch		1,000	10 oz.
Large Mouth Black Bass		1,000	12 oz.
Catfish		<u>1,500</u>	1 lb.
Total	2,500	9,500	

F. Violations

No violations were observed through this period. All losses of gasoline on the job ended with the arrest of one man on January 9, last report period. No further losses have been experienced.

VII OTHER ITEMS

Personnel

David B. Marshall, Refuge Manager, GS-5, was given a probational appointment on September 5, 1950 after his name appeared on the Civil Service eligible list.

Refuge Manager, Thomas C. Horn, was promoted from GS-9 to GS-11 on July 23, 1950.

The present State Fish and Game Commission's PR crew consisted of the following on August 31, 1950:

Concrete Crew Foreman	1
Dragline Operators	3
Tractor Operators	2
Oilers	3
Truck Drivers	3
Concrete Finisher	1
Laborers	3
El. Grader Operator	<u>1</u>
Total	17

REFUGE Stillwater Wildlife Management Area

W A T E R F O W L

MONTHS OF May to August, 19 50

(1) Species Common Name	(2) First Migrants Seen		(3) Peak Concentration		(4) Last Migrants Seen		(5) Young Produced		(6) Total
	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
1. <u>Swans:</u> Whistling swan									
2. <u>Geese:</u> Canada goose Cackling goose Brant White-fronted goose Snow goose Blue goose	25	June 30	2,800	Aug. 14			6	46	2,800
3. <u>Ducks:</u> Mallard Black Duck Gadwall Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveller Wood duck Redhead Ring-necked duck Canvas-back Scaup Golden-eye Buffle-head Ruddy duck			4,925	Aug. 22			12	615	5,000
			1,000	Aug. 22			37	1,335	1,200
	100	Aug. 7	2,200	Aug. 22			4	60	2,200
	600	Aug. 14	5,675	Aug. 22			4	60	5,700
	2,050	Aug. 22	2,050	Aug. 22					2,100
			10	July					10
			730	July			21	600	730
			2,700	July 31			94	2,300	2,700
			4	June	3	July 31			4
			5	June	2	June 26			3
			5	May	2	July 12			5
			500	May 5			6	100	500
4. <u>Coot:</u> 3-1750 (June 1949)			10,000	Aug. 14			26	5,500	10,000

Form MR-1

(over)

SUMMARIES

Total Production:

Geese 46

Ducks 5,124

Coots 5,500

Total waterfowl usage during period 34,152

Peak waterfowl numbers 25,375

Areas used by concentrations Big Water. Ponds in north central part of Stillwater marsh. Ponds on edges of marsh.

Principal nesting areas this season Same as used by concentrations, excepting Big Water

Reported by LeRoy W. Giles & David B. Marshall

INSTRUCTIONS

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance.
- (2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) Peak Concentration: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.
- (5) Young Produced: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Stillwater W. M. AreaMonths of May to August 1945

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Hared Grebe			30	May 24				3	7	30
Western Grebe			300	Aug. 29					?	300
Pied-billed Grebe			50	August				1 seen	?	50
White Pelican			1,500	May 5						2,000
Double-crested Cormorant			30	Aug. 29						40
Blue Heron			1,000	August			1	155	600	1,100
American Egret			40	August			1	6	30	40
Snowy Egret			800	August			1	168	500	800
Black-crowned Night Heron			5,000	August			1	964	3,480	5,000
American Bittern			5	August						5
White-faced Glossy Ibis			400	August			2	30	150	500
Virginia Rail			100	August				Unknown		100
Sora			400	August				Unknown		400
II. <u>Shorebirds, Gulls and Terns:</u>										
Snowy Plover			75	July 21					?	75
Semipalmated Plover			6	May 11						6
Killdeer			50	July				Unknown		50
Black-bellied Plover			10	May 16						10
Long-billed Curlew			2	June 2	1	Aug. 21				3
Spotted Sandpiper			5	May 16						10
Willet			8	May 15						15
Greater Yellow-legs			4	Aug. 29						10
Knot			2	May 16						2
Least Sandpiper			26,500	July 21						30,000
Dowitcher			1,100	Aug. 29						1,600
Western Sandpiper			10,000	Aug. 8						12,000
Marbled Godwit			350	Aug. 8						350
Avocet			3,000	August				Unknown		3,000

(over) (continued on next page)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow					
			Reported by.....		

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS **CONTINUED**
(other than waterfowl)

Refuge..... Months of..... to.....194.....

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow					
			Reported by.....		

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752

Form NR-2

(April 1946)

UPLAND GAME BIRDS

1613

Refuge Stillwater W. N. AreaMonths of May to August, 194 50

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Valley Quail									50	Intermittent use of Area.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Stillwater Wildlife Management Area

Months of May thru August 1950

(1) VARIETY	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED USE		
				TRANS- FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Barley	4,110	none	4,110					4,110	4,060	50	0

(8) Indicate shipping or collection points Fallon, Nevada

(9) Grain is stored at Stillwater Headquarters

(10) Remarks No grain used or received this period

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lbs., Corn (ear)—70 lbs., Wheat—60 lbs., Barley—50 lbs., Rye—55 lbs., Oats—30 lbs., Soy Beans—60 lbs., Millet—50 lbs., Cowpeas—60 lbs., and Mixed—50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately: Corn, wheat, proso millet, etc. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share-cropping, or harvest from food patches.
- (4) A total of Columns 2 and 3.
- (6) Column 4 less Column 5.
- (7) This is a proposed breakdown by varieties of grain listed in Column 6.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters grainary", etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

ANAHO ISLAND RESERVATION

INTRODUCTION

Three inspection trips were made to Anaho Island Reservation. These trips were of one day duration. The first was made on May 15th followed by trips on June 26th and July 3rd.

The purpose of these visits was five-fold: To determine the productivity of the Island; to determine if human activity was interfering with the birds; to make a general biological reconnaissance of the Island; to replace damaged or missing boundary marker signs; and to band the young of the various nesting species.

A general description of the reservation appears necessary to facilitate an understanding of the information which appears later in this report.

Anaho Island, all of which is in the reservation, is situated one-half mile off-shore in Pyramid Lake, Washoe County, Nevada. Pyramid Lake has a maximum width of eight miles, is 37 miles long and over 300 feet deep. Anaho Island embraces roughly 250 acres. The center of the Island is characterized by steep rocky slopes and cliffs which reach a height of about 500 feet above the Lake level. From the base of this rocky prominence the Island slopes more gently down to the water's edge. This slope is broken by a series of old beaches.

The wildlife importance of the Island lies in its use by colony nesters, notably pelicans, cormorants, gulls, and terns.

The Island vegetation is typical of western Nevada. Where not too rocky, saltbrushes (Atriplex) and greasewood (Sarcobatus vermiculatus) are present along with occasional annuals and grasses. The shoreline contains some patches of saltgrass (Distichlis sp.) and alkali weed (Echinopsilon hyssipifolium). The cliffs of the Island support little or no vegetation.

Several species of lizards along with the birds were the only conspicuous animals seen.

Access to the Island was by boat launched from the boat landing at Sutcliff, 3 1/2 miles from the Island. For this 3 1/2 mile trip the 14 foot Larson boat and 10 horse Johnson motor purchased last year proved adequate.

I GENERAL

A. Weather Conditions

See Stillwater section of report

B. Water Conditions

The Truckee River flows into Pyramid Lake and is the Lake's water source. The Lake has no outlet. With the beginning of the Newlands Irrigation Project, most of the Truckee River water has been diverted at Derby Dam for irrigation purposes and consequently fails to reach the Lake. A steady lowering of the water level of Pyramid Lake has resulted and at present the Lake level is dropping around three feet per year. From September 1948 to September 1949 the lake receded 41 1/2 inches. This is the first of annual measurements being taken by Thomas J. Trelease, State Fisheries Technician. At this rate we can expect Anaho Island to become a part of the mainland in the neighborhood of ten years, as soundings made in August of 1948 between the southeast tip of the Island and the mainland's east shore showed the maximum depth to be 38 feet at that time. If the Lake receded 41 1/2 inches from September 1949 to September 1950, as during the year before, that would mean the maximum depth is now about 31 feet. Whether birds will continue to nest on Anaho after the Island becomes a peninsula is a subject for conjecture.

C. Fires

About 1 1/2 acres of saltgrass on the south end near the gull colony was burned, prior to our first visit on May 15. Cause of the fire is unknown.

II WILDLIFE

A. Migratory Birds

1. Population and Behavior

A number of investigators have written, or commented, on the birds of Anaho Island. Ben H. Thompson in History and Present Status of the Breeding Colonies of the White Pelican (Contribution of the Wildlife Division, Occasional Paper No. 1, National Park Service) quotes a number of writers who made visits to the Island as far back as 1879.

Since Thompson's paper, Bond, "Birds of Anaho Island, Pyramid Lake, Nevada," (Condor, Vol. 42, No. 5, 1940) and Alcorn, "Observations on the White Pelican in Western Nevada", (Condor, Vol. 45, No. 1, 1943) published on their visits to the Island. We have attempted to compare findings of these writers with our own to determine what population changes have taken place. This, and other data, follows by species.

Eared Grebe. Two were seen in the water just off the Island on July 3rd.

Western Grebe. Several were present in the water at the edge of the Island.

White Pelican. The pelican colonies of the Island are by far the most important asset of the reservation. Best estimates of the number of adults present were made on May 15 when 4,000 were present on the Island and another 1,000 were seen at the mouth of the Truckee River. Since pelicans range over a vast area from Anaho Island, this is far from being a complete count of adults. For example, on the Stillwater Wildlife Management Area, alone, 400 pelicans were counted on May 16th.

Nesting extended over a long period, and close to 15 nesting colonies were present. The proximity of some colonies to others made separation difficult. Colonies extended from the water's edge to the top of the Island. Nesting commenced at the earliest date on the lower slopes close to water. It became progressively later with distance inland and at the higher elevations. On July 3rd birds from the lowest colony were almost fully grown while at the top of the Island hatching was not completed. On May 15 young found near the water were in the downy stage while further up the Island pipping of eggs had begun. No activity was noticed at the summit of the Island at this time.

July 3rd appeared to be the best time for counting young as hatching was almost complete and few if any, young had left the area. At this time a total of 4,160 young were counted. These were divided among 14 colonies, or pods, containing from 10 to 850 individuals each.

It is felt that our presence caused the death of some of the smallest young through excessive exposure to the sun, as the adults were quick to take to flight as we approached a colony.

The backs of several naked young were found pierced with blood running from the punctures. Possibly this injury was caused by California gulls. Pierced eggs with only part of the contents remaining also indicated gull predation.

The table shows figures on pelican numbers as found by other writers who visited the Island. Some of these writers visited the Island too early or too late in the season to obtain good figures. Nevertheless, the table does indicate that pelican production was at a high level in 1950. Possibly it was the highest observed in the last 70 years. Many writers of the past found considerably human interference by both white man and Indian. This kept reproduction down, as the Indians took pelican eggs for food and white men destroyed eggs and young because of the fish eating habits of the birds. The small number of nests and young found by Alcorn was possibly caused by Naval Aviation activity over the Lake during the War.

On July 3rd we banded 50 young pelicans.

WHITE PELICAN POPULATIONS AT ANAHO ISLAND

Date	Observer	No. Nests Occupied	No. Eggs	No. Young	Adults
August, 1882	Russel			1,400	
1903	Chapman		139	4,000	
June 3, 1921	Evermann	2,381			
June 5 & 6, 1924	Hall	4,534	6,234	816 in nest	*10,000
June 9, 1932	Cooper	2,994		300 out of nest	6,000
June 21 & 22, '40	Bond			3,200	
June 14, 1942	Alcorn	1,761		1,553 out of nest	
May 15, 1950	Giles and				
July 3, 1950	Marshall		16	4,160	5,000

* This is an estimate of total adults using the colony, based on adults counted at Lake, those that came in after dark and those present in other areas at time count was made.

Double-crested Cormorant. The number of cormorants nesting on the Island has shown a tremendous increase in the last ten years. We found 1,200 adults using the Island for nesting as against 50 nests found by Bond in 1940. Hall makes no mention of cormorants using the Island for nesting.

On May 15 we found eggs but no young. By July 3, hatching was almost complete. Young were at all stages, some being able to fly. At this time 1,650 young and 17 eggs were counted. These were divided among five nesting colonies, all of which were situated on tufa deposits along the water's edge short distances apart at the northeast edge of the Island. Nest material was alkali weed.

Twenty-five young cormorants were banded.

Blue Heron. On May 15 ten nests were found which contained young. On July 3rd 27 blue herons were seen. Some of these were undoubtedly fully-grown young. Also at this time a nest with four young and another with three eggs were observed.

Canada Goose. On all three visits "honkers" were seen in the water around the Island. Many of these could not fly and were presumed to be young produced on the Island. Their plumage development was so far advanced that they were indistinguishable from the adults.

May 57 BW

A total of 327 Canada geese were counted on July 3rd.

Mallard. On July 12 a brood with six Class III young was seen in addition to 12 other mallards in the water at the Island's edge. Quite probably the young came from the Island.

Gadwall. Four were seen with a flock of six pintail flying over the water along the edge of the Island on July 3.

Pintail. A lone female was seen on July 3 on the shore of the Island. Also seen was a pair in the water and the flock mentioned above.

American Merganser. Twenty-five were seen just off the Island.

Marbled Godwit. Six were flushed from the Island's edge.

California Gull. A California gull colony was found on a sandy cove at the south shore of the Island. Two thousand adults were estimated present at this colony. On May 15 numerous depressions in the sand indicated the start of nesting. A few of these depressions contained eggs varying in number from one to three, the usual number being two. On June 26 most young were hatched. An examination of the photographs of the colony indicated the presence of 300 young. A mortality of at least 200 was noted. Reproduction thus appears low with mortality high. Fifty young gulls were banded.

Caspian Tern. This bird has not been noted nesting on the Island by previous observers. Apparently it is a new-comer. Twenty-five tern nests were found at the gull colony on July 26 and July 3. Hatching was taking place.

Mourning Dove. A pair was seen on May 15.

2. Food and Cover.

Food and cover for the ducks and geese found around the Island does not seem adequate. We do not know what the ducks could have been eating. The shoreline and deep water off the Island lacks emergent and submergent growth. The geese quite possibly feed on the saltgrass, particularly new growth appearing in the burned area.

Pyramid Lake and other waters of the region carry heavy fish populations which are, of course, used by the pelicans and cormorants. On June 26 roughly 75% of the fish regurgitated by young pelicans were carp (Cyprinus carpio), the remainder being chubs (Siniperca obesus) and cui-ui (Chamistes cujus). One regurgitated bullhead (Ameiurus sp.) was also found on this date. The fish picture was entirely changed on July 3, when no regurgitated carp or cui-ui were found, the only fish being chubs. The feeding habits of these birds thus may vary considerably over a short period and no conclusions

can be reached from one or two visits to the Island. Cormorant food was similar to that of the pelicans. The gulls were observed seizing regurgitated fish. One young white pelican coughed up 232 carp averaging two inches in length.

E. Predaceous Birds.

A pair of prairie falcons was seen flying about the cliffs at the summit of the Island. A pair of marsh hawks was also observed.

III DEVELOPMENT AND MAINTENANCE

A. Physical Development

The shore of the Island was checked for missing penalty signs. Two new signs were added to make complete the posting of the Island at quarter-mile intervals.

VI PUBLIC RELATIONS

B. Refuge Visitors

Dr. Frank Richardson, Professor of Zoology, University of Nevada, and four students visited the Island on June 2nd to study the birds present.

We have no knowledge of other visitors to the Island and saw no signs of human interference with the birds.

REFUGE Anaho Island

WATER FOWL

3 visits only - May 15, June 26, July 3, 1950

MONTHS OF

to

, 19

(1) Species		(2) First Migrants Seen		(3) Peak Concentration		(4) Last Migrants Seen		(5) Young Produced		(6) Total	
Common Name		Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period	
1. <u>Swans</u> :											
Whistling swan											
2. <u>Geese</u> :											
Canada goose									Unknown	327 7/3	
Cackling goose											
Brant											
White-fronted goose											
Snow goose											
Blue goose											
3. <u>Ducks</u> :											
Mallard									Unknown	19 7/3	
Black Duck											
Gadwall										4 7/3	
Baldpate											
Pintail										9 7/3	
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveller											
Wood duck											
Redhead											
Ring-necked duck											
Canvas-back											
Scaup											
Golden-eye											
Buffle-head											
Ruddy duck										25	
Amer. Merganser											
4. <u>Coot</u> :											

3-1750

(June 1949)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese Unknown

Ducks Unknown

Coots None

Total waterfowl usage during period Unknown

Peak waterfowl numbers Unknown

Areas used by concentrations edges of Island

Principal nesting areas this season Unknown

Reported by Leroy W. Giles & David B. Marshall

INSTRUCTIONS

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance.
- (2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) Peak Concentration: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.
- (5) Young Produced: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons</u> : Mourning dove White-winged dove					2, May 15
IV. <u>Predaceous Birds</u> : Golden eagle Duck hawk Horned owl Magpie Raven Crow Prairie Falcon					2, July 3
Reported by LeRoy W. Giles & David B. Marshall					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

3 visits only - May 15, June 26, July 3, 1950

Refuge Anaho Island~~Marquesas~~~~tax~~

194

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Eared Grebe										2, July 3
Western Grebe										4
White Pelican							14		4,200	14,000
Double-crested Cormorant							5		1,650	1,900
Blue Heron							1	10	40	60
II. <u>Shorebirds, Gulls and Terns:</u>										
Marbled Godwit										6, July 3
California Gull							1		500	2,500
Caspian Tern							1	25	not hatched	25 plus young

(over)

FALLON WILD-LIFE REFUGE

INTRODUCTORY INFORMATION

The following described land in this Area has been covered by the order creating the Stillwater Wildlife Management Area.

T. 21 N., R. 29 E.	Sections 1 and 12
T. 21 N., R. 30 E.	Sections 2 thru 11 incl.
T. 22 N., R. 29 E.	Section 36

Assuming that the above described area is now withdrawn from The Fallon Wildlife Refuge and has become part of the Stillwater Wildlife Management Area, the following described land is all that remains of the Fallon Refuge.

T. 22 N., R. 30 E. ^{Sec 2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 26, 28, 30, 32 & 34} ~~The 18 even numbered sections - 2 thru 36~~
9,600

Of this area of 11,520 acres, the following described area this year received some water and created a limited amount of live-stock forage and waterfowl habitat:

Township 22 North, Range 30 East

Section 20 - 205 acres
Section 30 - 39 $\frac{1}{4}$ acres
Section 32 - 55 $\frac{1}{4}$ acres

Thus, this year 1153 acres were of wildlife value to the Service for a short period of time.

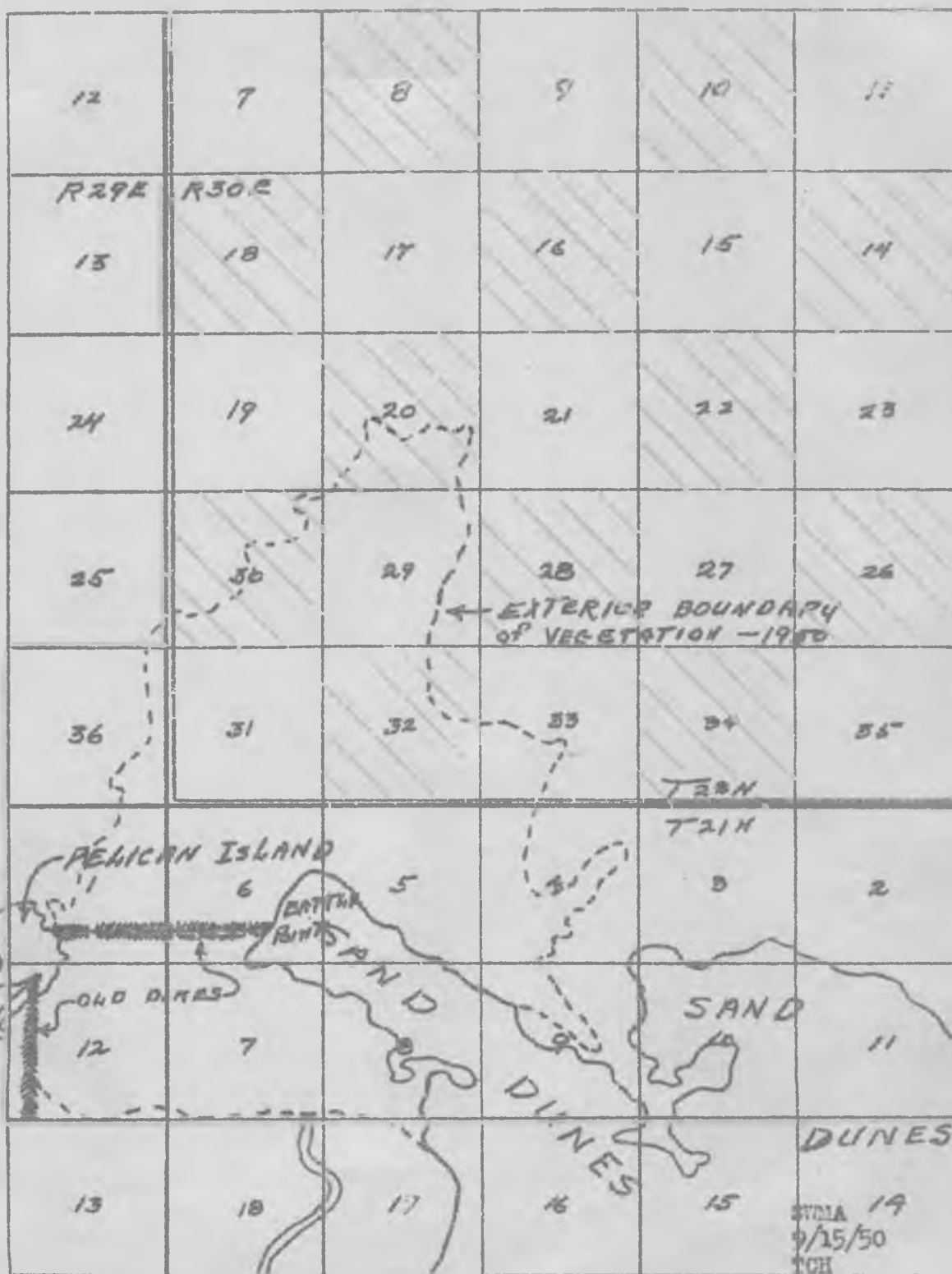
Vegetation on this area varies from year to year depending on the quantity of water it received. This year growth consisted of paludosus, saltgrass and sea-blite, (Suaeda sp.).

The dike system, now in the Stillwater Wildlife Management Area, constructed (probably with E.R.A. funds) has fallen into a bad state of repair and no longer has value for control of water. The wooden headgates have deteriorated and the earth around them has been washed away. Both dikes each have a large break in them. Previous washing and livestock trampling have reduced the dikes to a narrow ridge.

The entire Pelican Island Area including the Fallon Wildlife Refuge was mapped this period by Refuge personnel in 5" scale.

The small map (next page) shows that portion of the Fallon Wildlife Refuge having wildlife value this year.

PELICAN ISLAND AREA



Boundary, Stillwater Wildlife Management Area

Yellow Wildlife Refuge

Old Boundary Yellow Wildlife Refuge

Water Conditions

A small amount of winter flow continued into the marsh area south of this refuge until about May first. No further inflow took place until late in the summer after State Fish and Game Commission officials request of Truckee-Carson Irrigation District that any available water be diverted that way as part of their management of the open hunting area. Inflow started about July 15th and has continued intermittently since. Very little of this reached the Fallon Wildlife Area.

Although no sick birds have been observed on this area, to date, conditions are now prime for a serious botulism outbreak. This Pelican Island area is historically the source of terrific botulism production.

Migratory Birds.

Population and Behavior

Because of water conditions on this area through this period, waterfowl use was too low to be worthy of discussion or reporting on NR forms.

Other Items

On June 5th Dan Evans, Jr., Secretary of the State Fish and Game Commission, proposed to the Truckee-Carson Irrigation District Board that the State Fish and Game Commission develop the Pelican Island Area, independent of the Fish and Wildlife Service. Much discussion of this followed at various times. A conference of State Fish and Game Commission officials, Mr. Paul T. Quick, Regional Office, and Mr. Frank Kent of the Central Office was held in Reno. The Service was asked at this meeting to abandon the Fallon Wildlife Refuge.

A special report on availability of water for this area was prepared and forwarded to the Regional Office on June 27, 1950.

While the State has lost some of their enthusiasm for this development, their intention to develop it appears to be firm.

WINNEMUCCA MIGRATORY BIRD REFUGE

WINNEMOCCA MIGRATORY BIRD REFUGE

This area was completely dry through this report period.

Composition credit for this report is as follows:

LeRoy W. Giles - Sections I A, B; II A, B, C, D; III A; V A;
David B. Marshall - Sections, II A, B, E; III C; IV A; Anaho Island;
Earl W. Nygren - Sections, I B, C;
Illa E. Cress - Sections, VI B, C;
Thomas C. Horn - Sections, II F; III A; VI A, E; Fallon Wild-Life
Refuge; Winnemucca Migratory Bird Refuge

Photos:

Marshall - Postcard size
Horn - 5 x 7 and aerial

The following NR forms are not applicable to this Area through
this report period:

- NR 3 - Big Game
- 4 - Small Mammals
- 5 - Disease
- 6 - Fish
- 7 - Plantings
- 8 - Cultivating Crops
- 8A- Grain Report
- 9 - Collections and Receipts
- 10 - Haying and Grazing
- 11 - Timber Removal

Submitted September 20, 1950



Thomas C. Horn
Refuge Manager



Photo No. 72 - Lorain on D Dike. Water level with top of mats and at 100 feet further will be two inches above top of mats. 9/6/50



Photo No. 69 - Carryall scraper on Dike SL-3, fill nearly completed. 7/21/50



Photo No. 70 - Lorain dragline, unloading mats ready to start stripping for PB-1 Dike ~~fill~~. 7/21/50



Photo No. 71 - Lima at Station 36+00 on Nutgrass Dike.

9/6/50



Photo No. 68 - Lima dragline starting operations on Swan Lake Canal. 7/21/50



Photo No. 66 - East 1/2 of spillway of Lahontan Dam. This year's water carryover should be considerably higher than recent previous year's. 6/29/50



Photo No. 64 - Lahontan Dam. Source of all Stillwater Marsh water. Water over spillway is loss through 24 inches of flashboards used to increase Reservoir storage above weir crest. Water raised 22 inches above weir crest with top storage of 294,400 acre feet. 6/29/50



8/23/50. Lima, 1-1/4 yd. dragline, on the move to the west end of Nutgrass Dike. The channel on the far side of the machine is the area stripped for the very west end of the PB Dikes.



8/23/50. Swan Lake Dike system (SL Series) from the north end.



8/23/50. Pintail Bay Dike from the east. Point of intersection of Nutgrass Dike is at near end of Pintail Bay Dike.



8/23/50. Aerial view of Marsh looking east, showing SL series of dikes, right to left, and PB series from center to top.



8/23/50. Aerial view of East Waterfowl Food Plot Area, showing East Canal - bottom to top; and from bottom (horizontally) Laterals 294, 314, 336, and 351. Contours show up well.



8/23/50. Looking northwest up the Swan Lake Canal. D Dike will cross the channel in foreground and block the flow from left to right.



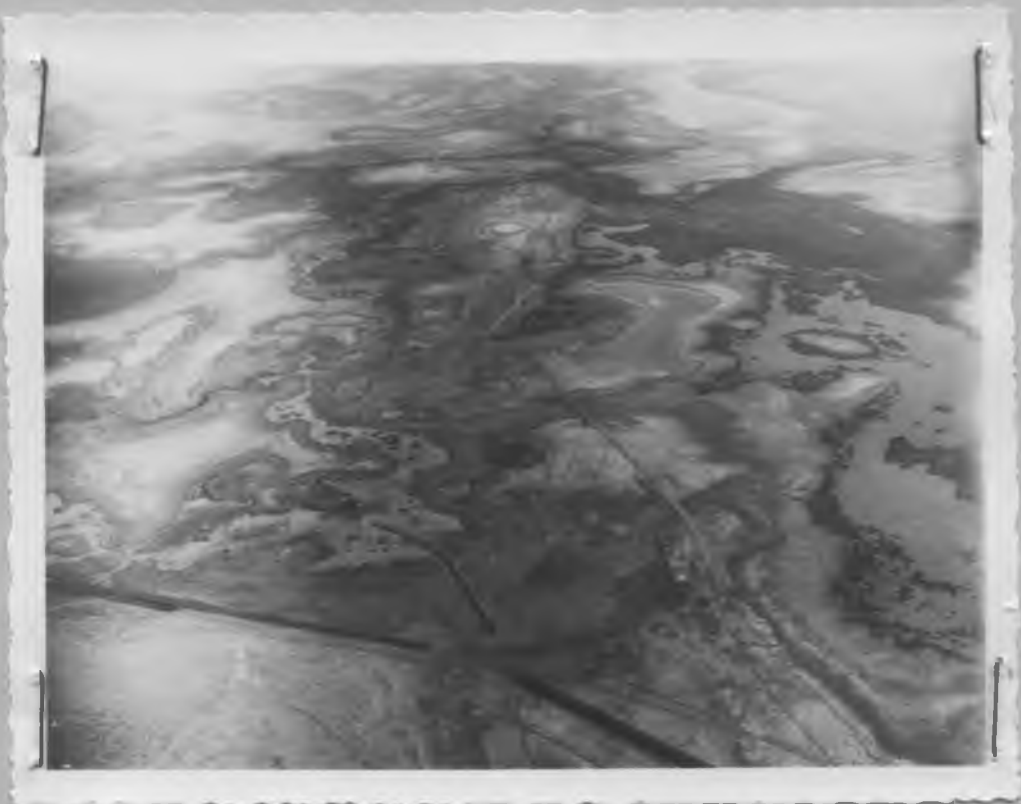
8/23/50. Refuge Headquarters plot with Stillwater Point Reservoir in background. The canal at left supplies the Marsh with water.



8/23/50. Refuge Headquarters plot with Stillwater Point Reservoir in background. This photo shows width of the Reservoir.



8/23/50. Elevating grader being serviced at southwest end of PB Dike.



8/23/50. Looking north from Navy Cabin along line of SL series of dikes. Structure No. 5 will be located at intersection of 3 canals in lower center of picture.



M-145. 2-1/2 yd. Lorain dragline in the shallow part of the D Dike fill. Water depth increased to about 30 inches further on. 9/1/50



M-146. Elevating grader on Pintail Bay Dike. This soil, intermittently dry and lake, is sufficiently dry at present to allow one depth of cut by the elevator. 9/1/50



M-147. West end of Swan Lake Bypass. The east end of this canal remains to be completed. 9/1/50



8/23/50. Tule Lake as seen from the air. Waterfowl consider this one of our best marsh ponds. The photo is a good illustration of plant growth pattern. Both the "circular" clumps of hardstem bulrush, (Scirpus acutus), in the lake and the zone of burro-weed (Allenrolfea) along the crest of the slope on the islands are typical.



M-143. Horses grazing on Scirpus americanus in Indian Lakes area. Note how heavily the plant has been grazed. Little S. americanus seed is being left here. 9/1/50



M-129. Typical view of overgrazed condition of Pelican Island Marsh. Plant is Scirpus acutus which obviously won't feed any ducks this year. 8/15/50



M-142. View of small pond in Indian Lakes. Despite the heavy grazing that occurs, this pond produced several waterfowl broods and is used extensively by waterfowl at all seasons. Nesting density was as high here as found anywhere on the Area. 9/1/50



M-132. This 53-acre lake of the Indian Lake group supported at least 25 broods in July. Only emergent growth is grazed Scirpus americanus. Broods were mostly gadwall. For its size, this lake held more broods than any other lake on the Area. 8/15/50



M-49. This is a typical view of the type of marsh in the Stillwater Area that was most productive of waterfowl. Emergent growth is Scirpus acutus. Open water contains heavy growths of sago pondweed. 8/9/49



M-126. Tamarisk in the Indian Lakes Area. 8/15/50



M-139, 8/16/50



M-140, 8/16/50

Two views of the type of desert range offering livestock forage on the Area. M-139 shows sea-blite, Suaeda torryana, and M-140, little greasewood, Sarcobatus baileyi, and shadscale, Atriplex confertifolia. Carrying capacity on this type of range will probably run from nothing to 25 acres per AUM.



M-128, 8/15/50



M-136, 8/16/50

Upper view, M-128, shows over-grazed saltgrass at Pelican Island. Lower, M-136, ungrazed saltgrass on island in Stillwater Marsh which livestock did not reach.



M-137, 8/16/50



M-59, 9/18/49

Two views of Scirpus paludosus. In the upper picture all seed heads have been clipped down by livestock. This type of waterfowl food destruction is typical of what occurs on this plant around ponds in the north central part of the marsh. The lower photo shows a great expanse of S paludosus in the Nutgrass Area which needs to be opened up, but remains untouched by livestock because the same plant is more easily obtained in other areas, as shown above.



M-134, 8/16/50



M-135, 8/16/50

Two views showing conditions created by moderate to heavy grazing opposed to light or no grazing at endge of ponds in Lead Lake Area. The upper photo is typical of island conditions where livestock seldom venture due to deep water. Here cattail grows up to the saltgrass. Lower photo taken along the mainland where spring grazing of cattail has kept free from growth the open water between saltgrass and cattail in deeper water. This band of open water is heavily used by waterfowl.



M-121. Before 5/29/50

Tamarisk controlled
by
2,4-D



M-119. After 6/29/50

All Anaho Island pictures taken on
June 26, 1950, with the exception of M-123
which was taken on July 3, 1950.



M-116. A view from Anaho Island looking towards Pyramid Island and the east shore. The old shoreline shown on the Pyramid and the east shore dates only a few years back.



M-92. Summit of Anaho Island as seen from the gull colony. White pelicans nested from the shore to the summit.



M-113. Nest and eggs of the white pelican. As shown, pelican nests consisted of a shallow depression, a few sticks and an occasional pelican bone.



M-110. Unfeathered young white pelicans not yet ready to venture from nesting site. Note regurgitated fish.



M-105. This fellow is the same age as those in the lower picture.



M-108. Young pelicans at this stage moved about like a flock of sheep when approached. Note regurgitated fish in foreground and the dust created by the movement of the birds.



M-99. A colony of almost fully grown young cormorants. At this stage young would often hobble from one nest to another.



M-102. Newly hatched cormorants. Nest is constructed of alkali weed.



M-101. Hungry cormorants.



M-123. Young cormorant with deformed beak. Mandibles did not meet and one eye was missing.



M-89. California gull colony.



M-93. A close-up taken in the gull colony on July 26th. Note the young birds.



M-94. LeRoy Giles, Refuge Biologist, holding young California gull.